

INITIAL
NAVY TRAINING SYSTEM PLAN
FOR THE
MOBILE FACILITY

NOVEMBER 1998

November 1998

MOBILE FACILITY EXECUTIVE SUMMARY

This Initial Navy Training System Plan (NTSP) for the Mobile Facility (MF) program was developed by the Naval Air Systems Command using the Training Planning Process Methodology. This document provides the manpower, personnel, and training concepts for Navy and Marine Corps needed to support and sustain the MF program. These concepts will be further defined in updates to this document.

The MF is designed to provide a fundamental shelter that may be further configured as a maintenance or operational facility. These shelters are completely enclosed units capable of containing equipment and can be adapted to various support missions. The shelter is watertight to protect both equipment and personnel from the weather, and provides a controlled environment for equipment and personnel when at fixed operational sites. It also provides continued protection for the installed equipment when it is being transported.

Development of the MF side opening (Type A and B in 1979, Type C in 1986) added new dimensions to MF utilization. Applications previously considered impractical because of the limited floor space of a single unit can now be accommodated by use of the Side Opening MF. The Integration Unit Mobile Facility (INUMF) provides a method of joining basic and side opening mobile facilities into a functional, environmentally-controlled complex.

These self-contained workshops provide immediate and economical aircraft maintenance support. They are designed for land, sea, or air travel, can be relocated with an aircraft squadron anywhere in the world, and can be operational within a few hours.

A workload analysis was conducted using maintenance data extracted from the Naval Aviation Logistics Data Analysis database. The analysis shows that Marine Aviation Logistics Squadrons (MALS) Work Center (WC) 990 is undermanned. Currently, this shortage is overcome by augmenting personnel from the user work centers. However, these augmented personnel lack the necessary skills, knowledge, and certifications to perform many of the required maintenance tasks. With only minimal On-the-Job Training (OJT), the augmented personnel can only be used for less demanding tasks. Therefore, as a result of the workload analysis, it is recommended that the Table of Organization (T/O) be revised to provide adequate numbers of Support Equipment (SE) mechanics and technicians. This revision will require reallocating four billets within the MALS T/O. The requirement to augment WC 990 with other personnel will be significantly decreased once this reallocation is accomplished.

Additionally, WC 990 should be placed under the control of the SE Division (900). This would provide access to a larger population of skilled personnel (MOS 6072 and 6073), yet still allowing the use of augmented personnel for work not requiring special skills.

November 1998

MOBILE FACILITY

A similar workload analysis shows that the Navy Aircraft Intermediate Maintenance Departments do not have a manning problem in WC 990.

Formal training courses are established at Naval Air Maintenance Training Group Detachments North Island, California and Jacksonville, Florida. Personnel selected by Headquarters, Marine Corps for Military Occupational Specialties (MOS) 6072 and 6073 are trained in these courses to be SE technicians and mechanics. A new segment course, Support Equipment Mobile Facility Intermediate Maintenance will be on line in first quarter Fiscal Year (FY) 1999 to train maintenance aspects of the MF and its equipment.

**MOBILE FACILITY
TABLE OF CONTENTS**

	Page
Executive Summary.....	i
List of Acronyms.....	iv
Preface.....	vii
 PART I - TECHNICAL PROGRAM DATA	
A. Title-Nomenclature-Program.....	I-1
B. Security Classification	I-1
C. Manpower, Personnel, and Training Principals.....	I-1
D. System Description.....	I-2
E. Developmental Test and Operational Test.....	I-2
F. Aircraft and/or Equipment/System/Subsystem Replaced	I-2
G. Description of New Development	I-2
H. Concepts	I-8
I. Onboard (In-Service) Training.....	I-19
J. Logistics Support	I-20
K. Schedules	I-20
L. Government-Furnished Equipment and Contractor-Furnished Equipment Training Requirements.....	I-21
M. Related NTSPs and Other Applicable Documents	I-21
 APPENDIX A - POINTS OF CONTACT.....	 A-1

MOBILE FACILITY

LIST OF ACRONYMS

AIMD	Aircraft Intermediate Maintenance Department
AMD	Activity Manpower Document
AMIST	Aviation Maintenance In-Service Training
AMTCS	Aviation Maintenance Training Continuum System
AS	Aviation Support Technician
BUPERS	Bureau of Naval Personnel
CB	Circuit Breaker
CBT	Computer-Based Training
CINCLANTFLT	Commander in Chief, Atlantic Fleet
CINCPACFLT	Commander in Chief, Pacific Fleet
CM	Corrective Maintenance
CMC	Commandant, Marine Corps
CNET	Chief, Naval Education and Training
CNO	Chief of Naval Operations
COMNAVAIRESFOR	Commander, Naval Air Reserve Force
COMNAVAIRSYSCOM	Commander, Naval Air Systems Command
DA	Door Assembly
DSN	Defense Switched Network
ECU	Environmental Control Unit
ER	Efficiency Review
FY	Fiscal Year
FMS	Foreign Military Sales
HARDMAN	Hardware and Manpower
INUMF	Integration Unit Mobile Facility
ISO	International Standards Organization
MALS	Marine Aviation Logistics Squadron
MATMEP	Maintenance Training Management and Evaluation Program
MF	Mobile Facility
MFASO	Mobile Facility Type A Side Opening
MFBSO	Mobile Facility Type B Side Opening

MOBILE FACILITY

LIST OF ACRONYMS

MFCSO	Mobile Facility Type C Side Opening
MOS	Military Occupational Specialty
MP	Monitor Panel
MTIP	Maintenance Training Improvement Program
MTU	Maintenance Training Unit
NA	Not Applicable
NALDA	Naval Aviation Logistics Data Analysis
NAMP	Naval Aviation Maintenance Program
NAMTRAGRUDET	Naval Air Maintenance Training Group Detachment
NAS	Naval Air Station
NAWCAD	Naval Air Warfare Center-Aircraft Division
NAVAIRSYSCOM	Naval Air Systems Command
NCOIC	Non-Commissioned Officer In Charge
NEC	Navy Enlisted Classification
NTSP	Navy Training System Plan
OPO	OPNAV Principal Official
OPNAV	Office of the Chief of Naval Operations
OPNAVINST	OPNAV Instruction
PDA	Personnel Door Assembly
PDP	Power Distribution Panel
PM	Preventive Maintenance
PMA	Program Manager-Air
PP	Power Panel
PTB	Power Transfer Box
RFT	Ready For Training
RPA	Removable Panel Assembly
SE	Support Equipment
SPA	Side Panel Assembly
TD	Training Device
TEPDS	Tactical Electrical Power Distribution System
T/O	Table of Organization
TTE	Technical Training Equipment

November 1998

**MOBILE FACILITY
LIST OF ACRONYMS**

ULSS	User's Logistics Support Summary
VAC	Volts Alternating Current
VDC	Volts Direct Current
WC	Work Center

November 1998

MOBILE FACILITY

PREFACE

The Mobile Facility (MF) program is in the Production, Deployment, and Operational Support Phase of the acquisition process. This Initial Navy Training System Plan (NTSP) was developed to establish and/or verify manpower and training requirements for Navy and Marine Corps activities. This is the first iteration of the Initial NTSP for the MF program. This document explores the various employment and support alternatives.

This Initial NTSP is a product of the Training Planning Process Methodology (TRPPM), as outlined in OPNAV Publication P-751-3-9-97.

PART I - TECHNICAL PROGRAM DATA

A. TITLE-NOMENCLATURE-PROGRAM

- 1. **Title-Nomenclature-Acronym.** Mobile Facility (MF)
- 2. **Program Element.** N70500

B. SECURITY CLASSIFICATION

- 1. **System Characteristics** Unclassified
- 2. **Capabilities** Unclassified
- 3. **Functions**..... Unclassified

C. MANPOWER, PERSONNEL, AND TRAINING PRINCIPALS

- OPNAV Principal Official (OPO) Program Sponsor CNO (N881)
- OPO Resource Sponsor CNO (N881C2)
- Marine Corps Program Sponsor CMC (ASL)
- Developing Agency NAVAIRSYSCOM (PMA205)
- Training Agency CINCLANTFLT (N721)
CINCPACFLT (N343)
CNET (ETE32)
- Training Support Agency NAVAIRSYSCOM (PMA205)
COMNAVAIRESFOR
- Manpower and Personnel Mission Sponsor CNO (N12)
NAVPERSCOM (NPC-4, NPC-404)
- Director of Naval Training CNO (N7)
- Commander, Reserve Program Manager COMNAVAIRESFOR (N4314)
- Marine Corps Combat Development Command
Manpower Management TFS Division

D. SYSTEM DESCRIPTION

1. Operational Uses. A standardized van called a tactical shelter or MF was adopted in 1975 and the military, commercial, sea-land, containerization concept became a reality. The basic MF is a fundamental tactical shelter. It is constructed of foam and beam material with an exterior surface of white painted aluminum. The MF can be configured as a maintenance, supply, operations, administrative, or personnel support relocatable facility. Large 48-inch by 76-inch end doors permit end-to-end positioning of two or more MFs. These MFs are used by Navy and Marine Corps intermediate level maintenance and administration personnel.

Development of MF side opening (Type A and B in 1979, Type C in 1986) added new dimensions to MF utilization. Positioning two or more MF side openings adjacent to each other to create unlimited floor space can now accommodate applications previously considered impractical because of the limited floor space of a single unit.

The Integration Unit Mobile Facility (INUMF) provides a method of joining basic, side opening, and other INUMFs into a functional, environmentally-controlled complex.

These self-contained workshops provide immediate and economical aircraft maintenance support. They are designed for land, sea, or air travel, can be relocated with an aircraft squadron anywhere in the world, and can be operational within a few hours.

2. Foreign Military Sales. Foreign Military Sales (FMS) are available on a case-by-case basis.

E. DEVELOPMENTAL TEST AND OPERATIONAL TEST. The MFs addressed in this NTSP have been in the Navy inventory for a number of years. Developmental and operational tests have all been completed.

F. AIRCRAFT AND/OR EQUIPMENT/SYSTEM/SUBSYSTEM REPLACED. Not Applicable (NA).

G. DESCRIPTION OF NEW DEVELOPMENT

1. Functional Description. The MF is designed to provide a fundamental shelter that may be further configured as a maintenance or operational facility. These shelters are completely enclosed units capable of containing equipment and can be adapted to various support missions. The shelter is watertight to protect both equipment and personnel from the weather. The shelter provides a controlled environment for equipment and personnel when at fixed operational sites. It also provides continued protection for the installed equipment when it is being transported. All major assemblies and installed attachments can be maintained, repaired, and replaced without removing other major assemblies. Each end panel of the shelter is provided with a single door

that can be locked internally, externally, or both. One side of the shelter is provided with a removable panel. During operation, the panel is removed; an air conditioning unit is installed on slides inside the shelter and pushed in place through the opening. Each corner of the shelter is equipped with an International Standards Organization (ISO) fitting, with each fitting designed for a maximum load of 100,800 pounds. In the transport mode, the upper ISO fittings can be used with overhead lifting devices such as cranes and helicopters to lift the shelters. The fittings can also be used to load or unload the shelter to or from cargo aircraft. The shelter is provided with a power entry panel located at the end of the left sidewall. The sidewall is provided with a Power Distribution Panel (PDP), power monitor panel, power transfer panel, wireway, and provisions for air conditioning (heat pump). Six 2-lamp and one 4-lamp fluorescent ceiling light fixtures provide interior lighting. Input electrical power requirements from external sources to the shelter are 120/208 Volts Alternating Current (VAC), 3-phase, 60 Hertz (Hz), 4-wire and 120/208 VAC, 3-phase, 400 Hz, 4-wire.

MFs are manufactured in compliance with ISO and American National Standards Institute shipping container standards. The ISO corner fittings may be used for lifting, towing, tying down, and securing complex MFs to each other. MFs may be transported by air, ship, or air ride trucks; or mounted on an M1022 Dolly Set and towed by a prime mover. MFs are designed to permit movement by material handling equipment from either side. Butting kits and walkways are provided with MFs and used to provide passageways between MFs in a complex. Butting kits and walkways are stored and secured in MFs for shipment. Connectors used in electrical power distribution systems are standard 100-amp and 200-amp class L connectors under Military Specification MIL-C-22992.

2. Physical Description. There are seven MF types, Turnkey Type A and B, Side Opening Type A, B, and C, Modified Side Opening Type B, and INU. The MFs are constructed with foam and beam insulated panels. The MF end framework and base is made of steel. Three removable skids are attached to the bottom of each MF type. With the three bottom skids removed, MFs are 8 feet high, 8 feet wide, and 20 feet long. The overall dimensions are the same for all seven types of MFs as follows:

Payload (maximum)	14,765 pounds
Tare Weight.....	5,235 pounds
Shipping Weight.....	20,000 pounds
Shipping Volume.....	1,315 cubic feet
Overall Dimensions:	
Exterior:	
Length.....	239 inches
Width.....	96 inches
Height.....	99 inches
Interior:	
Length.....	232 ¼ inches
Width.....	90 inches
Height.....	84 ½ inches

These seven MF types are configured depending on the type and use. The interior and exterior features are listed below followed by a table showing the configurations.

a. Exterior Features

(1) Personnel Door Assembly. All MFs except the A and B side opening have a hinged, 48-inch wide by 76-inch high removable Personnel Door Assembly (PDA) at each end. The door includes a latching mechanism and louver assembly. A T-latch assembly and keeper allows the door to be held in the open position.

(2) Removable Panel Assembly. The Removable Panel Assembly (RPA) is used to cover one or two Environmental Control Unit (ECU) accesses during storage and shipment. It is removed to allow the ECU to be rolled out on a roller track assembly and placed in the operational position. The ECU is rolled inside and a watertight RPA is reinstalled for MF storage or movement. On the INUMF the RPAs are on the left and right side of the MF. They are removed for complexing and operations.

(3) Power Panel. The Power Panel (PP) has connectors installed for input of 120/208 VAC, 3 phase, 60 Hz, 100 amps and 120/208 VAC, 3 phase, 400 Hz, 100 amps. A 200-amp capability is also available. A grounding terminal lug is available for MF grounding.

(4) Power Transfer Box. The MF Power Transfer Box (PTB) contains output receptacles for transferring 120/208 VAC, 3 phase, 60 Hz, 100 amps and 120/208 VAC, 3 phase, 400 Hz, 100 amps to another MF. Heavy-duty class L electrical connectors and Military Specification MIL-C-22992 are used in all PTBs. A 200-amp capability is also available. The INUMF contains three PTBs.

(5) Environmental Control Unit Cover Assembly. On the INUMF, a hinged cover assembly on the left side closes the ECU access opening when the ECU is removed for maintenance, storage, or shipment.

(6) Side Panel Assembly. A removable Side Panel Assembly (SPA) allows side to side complexing with other side opening MFs. The SPA louver assembly is identical to those installed on standard MF PDAs. A MF Type A Side Opening (MFASO) can be complexed with another MFASO, MF Type B Side Opening (MFBSO), MFBSO Modified, or MF Type C Side Opening (MFCSO). Using swinglock bridges and gaskets, side-opening MFs are complexed to form larger continuous spaces of almost any size. When complexed, SPAs are stored on the MF roof and secured with bracket assemblies. SPAs are reinstalled for MF storage or shipment.

(7) Door Assembly. Some Type B and Type B modified MFs have a Door Assembly (DA) on the left side between the ECU access RPAs. This door is smaller than a standard PDA measuring 32 inches wide by 66 inches high. The louver assembly is identical to those installed on standard MF PDAs and SPAs.

b. Interior Features

(1) Power Distribution Panel. The PDP contains Circuit Breakers (CB) used to distribute power within the MF. Blank spaces may be used during configuration to add CBs to provide power for additional installed equipment. The MFBSO contains a 200-amp main CB.

(2) Monitor Panel. The Monitor Panel (MP) provides the capability to check voltage and frequency of input power for both 60 Hz and 400 Hz. Although 28 Volts Direct Current (VDC) test points are available on the MP, there is normally no 28 VDC power supply installed. A combination of lights and switches allow a phase rotation check of 60 Hz and 400 Hz inputs.

(3) Environmental Control Unit. A standard 3-ton ECU installed on a roller track assembly provides MF cooling and heating. The ECU is rolled out when the MF is in an operational condition and secured inside for MF shipment or storage.

(4) Environmental Control Unit Panel. The ECU Panel Assembly provides interface between the ECU and MF electrical power systems. The panel assembly has a filter assembly for return air and mounting for the thermostat assembly. It provides a means for securing the ECU during operation and shipment.

(5) Lighting System. Six 2-lamp and one 4-lamp fluorescent tube lights provide interior lighting. Three-way switches located in the overhead at each end of the MF control the lights. A battery powered emergency lighting system is included in the light fixture. It provides power to one fluorescent tube to provide sufficient light for equipment shutdown and evacuation in the event of a power failure. A disable switch allows the emergency system to be turned off during inactive periods, storage, or shipment.

(6) Environmental Control Unit Ducting. Overhead ducting on the MF centerline provides for even distribution of warm or cool air from the ECU. A removable transition assembly allows the ECU to be disconnected from the overhead ducting and rolled in for storage or MF movement. It is used to connect the ECU with fixed ducting when operating.

(7) DC Power Supply. A 50-amp, 28 VDC power supply is installed as required.

(8) Power Transfer Circuit Breakers. Five circuit breakers mounted in individual surface enclosures are used to protect 60 Hz and 400 Hz primary power distribution systems which provide power within the INUMF and to other complexed MFs.

(9) Air Conditioning. The INUMF air conditioner is a window type unit, which is removed and packed out for shipment. A commercial air conditioner is used in the INUMF. The air conditioner provides nominal 10,000 BTU heating and cooling capacity. A sleeve assembly is used to install the air conditioner.

(10) Environmental Control Unit Installation. Provisions are included for installation of one or two ECUs during configuration. These ECUs are typically standard 3-

ton units. Larger capacity ECUs may be installed when required. Installation of ECUs, ECU panel assemblies, and ECU ducting are accomplished during configuration based on heating and cooling requirements of installed systems.

(11) Double End Door Installation. Double doors with nominal opening measurements of 80 inches wide by 82 inches high are installed on the rear end of the MF Type B (MFB).

TABLE I-1. EXTERIOR CONFIGURATIONS

	TURNKEY TYPE A	TURNKEY TYPE B	INUMF	MFASO	MFBSO	MFBSO (MOD)	MFCSO
PDA	X	X	X	X			X
RPA	X	X	X	X	X	X	
PP	X	X		X	X	X	
PTB	X	X	X				
ECU Cover Assembly			X				
SPA				X	X	X	X
DA					X	X	
Double End Door Install						X	

TABLE I-2. INTERIOR CONFIGURATIONS

	TURNKEY TYPE A	TURNKEY TYPE B	INUMF	MFASO	MFBSO	MFBSO (MOD)	MFCSO (See Note)
PDP	X	X	X	X	X	X	
MP	X	X		X	X	X	
ECU	X	X		X	X	X	
ECU Panel	X	X		X	X	X	
Lighting Sys	X	X	X				
ECU Ducting		X					
DC Power Supply		X					
Power Transfer CB			X				

TABLE I-2. INTERIOR CONFIGURATIONS							
	TURNKEY TYPE A	TURNKEY TYPE B	INUMF	MFASO	MFBSO	MFBSO (MOD)	MFCSO (See Note)
Air Conditioning			X				
ECU Installation	X	X		X	X	X	

Note. There are no standard electrical power systems installed in MFCSO. Lights or other electrical equipment may be installed during configuration.

3. New Development Introduction. NA.

4. Significant Interfaces. MFs can be complexed in a myriad of ways to satisfy operating and space requirements at the site. The following major equipment items are used to complex MFs.

a. Butting Kit and Walkway. Butting Kits and Walkways provide a means of connecting MFs and providing a passageway between MFs when complexed. They are removed and packed out for MF shipment.

b. Power Cables. Power Cables are fabricated in various lengths and in 100 and 200-amp capabilities. They are used for power input and transfer between MFs. Connectors on 60 Hz and 400 Hz cables have different shell arrangements to prevent improper installation.

c. Jack and Adapter Assembly. Jack and Adapter Assemblies are used to aid in leveling and complexing MFs.

d. Swinglock Bridges. Top transverse bridges and longitudinal side-end bridges secure side opening MFs to each other when complexed.

e. Bracket Assemblies. Bracket Assemblies are used to secure SPAs on the MF roof when removed. The smaller bracket will secure one SPA to the roof of MFASO, MFBSO, and MFBSO (Mod). The larger bracket will secure two panels to the roof of MFCSO.

f. Dolly Set, M1022. The Dolly Set consists of front and rear dolly assemblies that attach to the front and rear ISO fittings. The dolly set can be used for local movement, highway travel, and cross-country movement when towed by an approved prime mover. The M1022 Dolly Set can raise and lower the MF by means of hydraulic pumps and two hydraulic lift cylinders on each dolly. Pumps can be hand-operated or by air motors when an external air source is available. The front dolly has an attached toolbox that contains accessories and tools necessary to operate the M1022.

g. Lifting Spreader ISO, Model 214LS20. The Lifting Spreader is designed for lifting MFs and other ISO containers on or off transport vehicles such as trailers or container ships. The spreader is designed to support more than the 20,000 pounds maximum shipping weight of a MF. The spreader is equipped with a twist lock coupler on each of the four corners which lock into ISO fittings on the MF top corners.

h. Mobile Facility Sling Assembly, Part Number MFBFN1040-1. The MF Sling Assembly is designed to on-load or off-load the MF from the transport vehicle for local movement and complexing. Working load for the sling assembly is 20,000 pounds.

i. Mobile Facility Program Tactical Electrical Power Distribution System. The power distribution box is the major component of the Mobile Facility program Tactical Electrical Power Distribution System (TEPDS). Three tactical, diesel engine-driven, generator sets are associated with power input to each power distribution box. Two generator sets are paralleled and connected to the power distribution box to provide power for MF complex use. The third generator set is held in standby.

5. New Features, Configurations, or Material. NA.

H. CONCEPTS

1. Operational Concept. The MF program answers an unlimited variety of needs for any member of the Navy or Marine Corps team with an operational or support function conducive to containerization. The program provides the equipment and know how required to ensure that sophisticated aircraft and other weapon systems can be maintained in environmentally controlled spaces, even in the most remote locations. With this program, personnel can deploy tactical weapon systems to any combat theater in the world and operate them indefinitely from any expeditionary location.

2. Maintenance Concept. The Naval Aviation Maintenance Program (NAMP), OPNAVINST 4790.2G, provides general direction and guidance regarding the three level maintenance concept. The NAMP prescribes the classification of maintenance requirements for functional complexity, provides assignment to maintenance levels which have the resources to effectively and economically accomplish maintenance actions, and details the administrative structure for collection of required data. The MF program utilizes two levels of maintenance, i.e., organizational and intermediate.

a. Organizational. The user of the Mobile Facility is considered the organizational level.

b. Intermediate. The Aircraft Intermediate Maintenance Department (AIMD) and Marine Aviation Logistic Squadron (MALS) Support Equipment (SE) Division 900 is responsible for the overall maintenance and readiness of the MFs and all related ancillary equipment.

At the AIMD, WC 990 is responsible for the maintenance of the MFs. It is performed by Aviation Support Technicians (AS) with Navy Enlisted Classifications (NEC) code 7603, Support Equipment Air Conditioning and Mobile Facility Technicians. These personnel perform installation and removal of MF assets as required.

At the MALS, Work Center (WC) 990 is responsible for the maintenance of the MFs. It is performed by Aircraft Maintenance SE personnel with Military Occupational Specialty (MOS) 6072, Hydraulics/Pneumatics/Structures Mechanic, and MOS 6073, Electrician/Refrigeration Mechanic. These personnel perform installation and removal of MF assets as required.

(1) Preventive Maintenance. Preventive maintenance includes pre-operational maintenance requirements, periodic maintenance requirements, and inspections to determine any physical damage or evidence of corrosion of the PP, PTB, ECU, MP, PDP, DC Power Supply, Power Transfer CB, Air Conditioning, and Lighting Systems.

(2) Corrective Maintenance. Corrective maintenance include fault isolation to a specific assembly, component or part; removal and replacement of faulty components or parts; performing functional tests on replaced components; performing required corrosion control procedures in accordance with NAVAIR 16-1-540 or NAVAIR 17-1-125 (as appropriate); and repair of any physical damage of the PP, PTB, ECU, MP, PDP, DC Power Supply, Power Transfer CB, Air Conditioning, and Lighting Systems.

c. Depot. NA.

d. Interim Maintenance. The MF program has no interim support requirements.

e. Life-Cycle Maintenance Plan. The projected service life of a MF is estimated to be 20 years. There is no rework cycle.

3. Manning Concept. Navy MFs are typically manned by the officer and enlisted personnel of an AIMD. Marine Corps MFs are typically manned by the officer and enlisted personnel of a MALS. An assessment of the Marine Corps enlisted and officer skills required to operate and maintain the MFs indicates that the existing MOS structure satisfactorily meets the Marine Corps MF skill requirements. Likewise, an assessment of the skills required to operate and maintain Navy MFs indicates the existing rating and NEC structure satisfactorily meets the Navy MF skill requirements.

An assessment of the quantity of personnel required to operate and maintain Navy MFs indicates existing AIMD requirements are satisfactory. A similar assessment of the quantity of personnel required to operate and maintain Marine Corps MFs indicates operator quantities are sufficient but maintainer quantities are insufficient. An explanation of this shortfall is contained in the following paragraphs.

a. Operator Manning. For the purposes of this document, with the exception of Navy and Marine Corps WC 990 MF, operators are considered to be those Navy and Marine

Corps AIMD and MALS work center personnel who are located in the MFs. WC 990 personnel are tasked with the setup, relocating/repositioning, maintenance, and general upkeep of the MFs; and for the purposes of this document, these WC 990 personnel are considered to be the maintainers of MFs.

Both Navy and Marine Corps MF operator personnel possess various aviation related rating-NEC combinations and MOSS. For a listing of the personnel in the various AIMD and MALS, refer to the specific Navy AIMD Activity Manpower Document (AMD) or Marine Corps MALS Table of Organization (T/O).

b. Maintenance Manning. As previously stated, Navy and Marine Corps MF maintainers are considered to be personnel in WC 990. A Navy WC 990 typically contains personnel in the AS rating. For a detailed listing of these personnel, refer to the specific Navy AIMD's AMD.

Interviews and telephone conversations with a number of Navy AIMDs indicate that the Navy does not have a manning problem or shortfall in WC 990. This is because their manpower requirements are regularly reviewed and adjusted, if necessary, as a part of the Efficiency Review (ER) process. In addition, since Navy AIMD WC 990 is under the control of the Support Equipment Division (900), it is able to draw on other 900 Division personnel assets if personnel with other skills are needed to perform MF maintenance functions.

Unlike a Navy WC 990, a typical Marine Corps MALS WC 990 falls under the control of the Avionics Division (600) vice the 900 Division. According to existing MALS T/Os, there are six enlisted billets in WC 990, all of which are either MOS 6072 or 6073. These are shown in Table I-3 below.

TABLE I-3. CURRENT WC 990 MANPOWER REQUIREMENTS			
TITLE	RANK	MOS	QUANTITY
Non-Commissioned Officer In-Charge (NCOIC)	GYSGT	6073	1
Assistant NCOIC	SSGT	6072	1
SE Mechanic	CPL	6073	2
SE Technician	CPL	6072	2

Although all MALS are manned the same as shown above, each of the MALS is required to support different quantities of Mobile Facilities, which may change over time. Table I-4 shows the quantities of MFs supported by activity as of April 1998.

TABLE I-4. QUANTITY OF MFs SUPPORTED BY ACTIVITY	
ACTIVITY	QUANTITY
COMMARFORPAC	
MALS-11	622
MALS-12	481
MALS-13	294
MALS-16	269
MALS-36	244
MALS-39	234
MALSEK	76
COMMARFORLANT	
MALS-14	590
MALS-26	273
MALS-29	270
MALS-31	393
4TH MAW (CNARF)	
MALS-41 (Fort Worth)	215
MALS-41 (Atlanta)	43
MALS-46 (Miramar)	7
MALS-49 (Stewart)	137

Interviews, telephone conversations, and point papers from MALS personnel indicate that the Marine Corps currently has a manning problem in WC 990. Since WC 990 is not manned with a sufficient amount of personnel to perform all the required MF maintenance functions, it is typically augmented by personnel in other MALS work centers at the rate of one

Marine per 25 MFs. These Marines possess aviation maintenance related MOSs, are assigned for short periods of time, and normally have not received any specific MF maintenance training. It is important to note that the one Marine per 25 MFs is a rule-of-thumb and not an official policy. The actual rate at any MALS may be more or less than the rate of one Marine per 25 MFs.

c. Estimated Maintenance Man-Hour per Month. Since Navy activities are adequately manned, these paragraphs detail the workload (i.e., man-hours per month) analysis performed for Marine Corps MFs.

An analysis of documented and undocumented maintenance functions was performed to estimate the number of annual maintenance man-hours associated with Marine Corps MFs. With the exception of MALS-31, monthly workload data was gathered from the five MALS in the 1st Marine Air Wing and then multiplied by 12 to arrive at an annual value. This monthly data represents a 30-day snapshot of the typical time spent by WC 990 in support of MFs. MALS-31 documented and estimated data was obtained for a one-year period. Documented man-hours were extracted from the Naval Aviation Logistics Data Analysis system and estimated data was obtained from surveys and interviews.

Table I-5 is a compilation of the workload data used for analysis. The column titled “Documented Man-Hours” contains the Corrective Maintenance (CM) and Preventive Maintenance (PM) annual man-hours documented against the maintenance of MF enclosures (vans). The column titled “Ancillary Equipment” is an estimate of the CM and PM performed on such ancillary equipment as ECUs, dolly sets, generators, MF jacks, lifts, and transporters. The column titled “Undocumented Man-Hours” is an estimate of the time expended on such functions as trouble calls to verify the gripe before writing up a Maintenance Action Form, preparing for and moving/recomplexing MFs, expediting and receiving parts, and time spent traveling to trouble calls or delivering ancillary gear.

TABLE I-5. MF MAINTENANCE MAN-HOURS PER YEAR				
UNIT	DOCUMENTED MAN-HOURS	ANCILLARY EQUIPMENT	UNDOCUMENTED MAN-HOURS	ANNUAL TOTAL
MALS-12	8064.0	4896.0	12636.0	25596.0
MALS-36	7807.2	3360.0	1728.0	12895.2
MALS Element Kaneohe Bay	6498.0	1740.0	864.0	9102.0
MALS-31	8712.0	10404.0	2880.0	21996.0
MALS-41	5040.0	3960.0	2820.0	11820.0
MALS-26	5928.0	2640.0	5772.0	14340.0

MF PM is a significant portion of the WC 990 annual workload. Table I-6 below displays the PM cycle workload associated with the ancillary equipment for the 393 MFs assigned to MALS-31. The column titled “Item” lists the nomenclature of the ancillary equipment. The column titled “Cycle” indicates the frequency of the PM maintenance function. The column titled “Time” lists the time in hours required to perform the PM maintenance function. Finally, the column titled “Total” lists the total annual hours required to perform the PM maintenance functions on ALL the “Items” assigned to the 393 MFs at MALS-31.

TABLE I-6. MALS-31 ANNUAL PM CYCLE WORKLOAD			
ITEM	CYCLE	TIME (HOURS)	TOTAL (HOURS)
MMG-1A	13-week	4.0	265.0
	26-week	4.3	
	52-week	5.5	
60 Kw Generator	13-week	5.0	576.0
	26-week	7.0	
20 Kw Generator	60-day	3.3	364.0
	160-day	7.2	
	300-day	7.6	
PTB	91-day	0.6	109.6
	182-day	1.7	
	364-day	24.5	
ECU	91-day	2.7	2326.5
	364-day	5.7	
Floor Jack	91-day	1.7	13.6
Jack Stand	91-day	0.3	12.8
	3-year	1.0	
Presto Lift	13-week	1.0	4.0
Press Van	91-day	6.2	32.8
	364-day	8.5	
Bench Vise	52-week	0.3	0.6
Paint Shaker	180-day	0.5	1.0
Metal Shear	90-day	0.5	2.0
Pressure Washer	3-month	2.0	40.0

TABLE I-6. MALS-31 ANNUAL PM CYCLE WORKLOAD			
ITEM	CYCLE	TIME (HOURS)	TOTAL (HOURS)
M1022,	13-week	3.8	115.8
	26-week	5.8	
	52-week	7.8	
Spreader Bar	13-week	7.0	84.0
Mobile Facility	91-day	6.2	2436.6
	364-day	2.0	786.0
MF Jack	91-day	0.3	20.4
	364-day	0.8	
Flat Bed Trailer	364-day	7.0	7.0
TOTAL			7197.7

Table I-6 above shows a requirement for 7198 man-hours of PM to support the 393 MFs. However, data displayed in Table I-5 includes documentation for both CM and PM (MALS-31 shows a total of 19,116 documented man-hours). It is inconclusive how much of the required PM shown in Table I-6 is a part of the documented hours shown in Table I-5

d. Recommended Qualitative and Quantitative Manpower Requirements

(1) Operators. As previously stated, MF operators are assumed to be MALS and AIMD personnel minus WC 990 personnel. Since these personnel simply work in MFs, it is assumed their quality and quantity are adequate to meet Navy and Marine Corps requirements and are therefore not covered in this document.

(2) Maintainers. As previously stated, for the purposes of this document MF maintainers are considered to be WC 990 personnel. Since the manpower requirements of Navy WC 990 are regularly reviewed under the ER process, it is assumed these requirements are adequate and therefore are not covered in this paragraph. However, since there are indications that the quality and quantity of personnel in Marine Corps WC 990 may be lacking, a workload analysis was performed in an attempt to determine the true requirement.

Determining the number of personnel required in WC 990 is accomplished by dividing the total workload (in man-weeks, man-months, or man-years) by the number of productive hours (weekly, monthly, or annually) available to a typical enlisted Marine. Tables I-5 and I-6 (above) provide an indication of the total workload of WC 990. To determine the number of Marines required to maintain the MFs, the number of productive hours available to a typical

enlisted Marine must be estimated. The following data was used to estimate a productive maintenance man-hour:

Length of Work Day.....	9.0 hours
Lunch and Physical Training	-1.5 hours
Administrative Matters	<u>-1.0 hours</u>
TOTAL Daily Productive Hours	6.5 hours
Annual Days Available.....	365
Holidays	-10
Weekends	-104
Rifle Range Quals.....	-10
Leave	-21
USMC Training	<u>-10</u>
TOTAL Annual Productive Days	210

The product of the Annual Productive Days (i.e., 210) and the Daily Productive Hours (i.e., 6.5) results in a productive man-year of 1365 hours. When this value is applied to the data in Table I-5, the approximate number of Marines required to support MFs can be estimated. These results are shown in Tables I-6 and I-7 (below).

TABLE I-6. ESTIMATED ANNUAL MAN-YEARS REQUIRED TO SUPPORT MFs						
UNIT	ANNUAL TOTAL (Table I-5)	ANNUAL MAN-YEARS	QUANTITY OF MFs SUPPORTED	AUGMENTED PERSONNEL (1 per 25)	T/O BILLETS IN WC 990	TOTAL
MALS-12	25596.0	18.75	481	19	6	25
MALS-36	12895.2	9.45	244	10	6	16
MALS Element Kaneohe Bay	9102.0	6.67	76	3	6	9
MALS-31	21996.0	16.11	393	16	6	22
MALS-41	11820.0	8.66	215	9	6	15
MALS-26	14340.0	10.51	273	11	6	17

TABLE I-7. PM CYCLE ANNUAL MAN-YEARS		
UNIT	PM CYCLE ANNUAL WORKLOAD (HOURS)	ANNUAL MAN-YEARS

TABLE I-7. PM CYCLE ANNUAL MAN-YEARS		
MALS-31	7198	5.2

An analysis of the data in Tables I-6 and I-7 (above) indicates that the quantity of personnel in WC 990, when augmented by other work center personnel on a 1 for 25 basis, is adequate to support the CM and PM workload of MFs. Quantitatively, the ratio of 1 for 25 does seem to be valid. However, the quality of these personnel (i.e., rank/MOS) is lacking because all but six of the billets are augmented personnel who do not possess MOS 6072 or 6073. Based on the T/O requirements (shown in Table I-3 above, there are only six personnel in WC 990 who possess the knowledge, skills, and certifications required to perform the CM and PM maintenance tasks associated with Marine Corps MFs. As the data in Tables I-6 and I-7 indicate, there is considerably more workload than six man-years. Table I-7 alone shows 5.2 man-years of PM. The augmented personnel provided to WC 990 are helpful, but have not received any formal SE training, and therefore, can only be used for minor tasks.

A new manning approach needs to be taken. Since the majority of MALS activities support hundreds of MFs and will continue to be required to support hundreds of MFs, WC 990 manning must be increased. However, there should be a compensated decrease in other work centers (those work centers currently supplying the augmented personnel). For purposes of quantifying the requirement, this analysis is setting a baseline of 250 MFs to be the minimum planned to be supported by each MALS, which, at the rate of 1 per 25, generates ten billets. Therefore, WC 990 manning should be increased from six to ten billets as shown in Table I-8 below. However, MALS activities supporting more than 250 MFs will still require personnel augmentation at a rate of 1 per 25 for the quantities over the baseline of 250.

Additionally, and perhaps the most significant change to be made, is that WC 990 should be placed under the control of the SE Division (900). This would provide access to a larger population of skilled personnel (MOS 6072 and 6073) to accomplish hard skill task requirements, yet still allowing the use of augmented personnel for work not requiring special skills.

TABLE I-8. NEW WC 990 MANPOWER REQUIREMENTS (BASED ON MAINTAINING 250 MF)			
TITLE	RANK	MOS	QUANTITY
Non-Commissioned Officer In-Charge (NCOIC)	GYSGT	6073	1
Assistant NCOIC	SSGT	6072	1
SE Mechanic	SSGT	6073	1
SE Technician	SGT	6072	2

TABLE I-8. NEW WC 990 MANPOWER REQUIREMENTS (BASED ON MAINTAINING 250 MF)			
TITLE	RANK	MOS	QUANTITY
SE Mechanic	SGT	6073	1
SE Mechanic	CPL	6072	1
SE Technician	CPL	6073	1
SE Mechanic	LCPL	6072	1
SE Technician	LCPL	6073	1

Based on the data and analysis contained and explained in the preceding paragraphs, it is recommended that the Marine Corps increase the quantity of MOS 6072 and 6073 billets in WC 990, compensated by other resources within the T/O, i.e., reducing billets in other work centers. This would more closely align the requirements to the actual workload, decrease the requirement to augment WC 990, and provide additional trained personnel to the WC. It is further recommended that WC 990 be placed under the control of the SE Division (900).

4. Training Concept. Formal training courses are established at Naval Air Maintenance Training Group Detachments (NAMTRAGRUDET) North Island, California, and Jacksonville, Florida. Personnel selected by Headquarters, Marine Corps for MOSs 6072 and 6073 are trained in these courses as SE technicians and mechanics. Navy personnel in the AS rating attend course number D/E-602-7035, Support Equipment Mobile Air Conditioner Intermediate Maintenance, to attain NEC 7603. A new course titled Support Equipment Mobile Facility Intermediate Maintenance will be on line in first quarter FY99 to train maintenance aspects of the MF and its associated equipment.

a. Initial Training. NA.

b. Follow-on Training. A new course (listed below) will be available in first quarter FY99 to train Navy and Marine Corps personnel in the peculiar requirement for the MFs.

Title **Support Equipment MF Intermediate Maintenance**
CIN C-602-3310
Model Manager .. NAMTRAGRUDET North Island
Description This course provides the basic skills and knowledge required for configuration and maintenance of the MFs. Upon completion of this course the students will be able to perform intermediate maintenance on MFs.

Location Maintenance Training Unit (MTU)-3032, Naval Air Station (NAS) Jacksonville
 MTU-3033, NAS North Island

Length 10 days

RFT date First quarter FY99

Skill identifier None

TTE/TD To Be Determined

Prerequisite MOS 6072 or 6073

c. Student Profiles

SKILL IDENTIFIER	PREREQUISITE SKILL AND KNOWLEDGE REQUIREMENTS
MOS 6072	<ul style="list-style-type: none"> ◦ C-602-2026, Aviation Support Equipment Technician Class A-1 ◦ D/E-602-7040, Support Equipment Engine/Gas Turbine and Related Systems Intermediate Maintenance
MOS 6073	<ul style="list-style-type: none"> ◦ C-602-2026, Aviation Support Equipment Technician Class A-1 ◦ D/E-602-7032, Support Equipment Electrician/Refrigeration Intermediate Maintenance
NEC 7603	<ul style="list-style-type: none"> ◦ C-602-2026, Aviation Support Equipment Technician Class A-1 ◦ D/E-602-7035, Support Equipment Air Conditioning and Mobile Facility Technician

d. Training Pipelines. The following training tracks apply and are available in the OPNAV Aviation Training Management System. MF training track revisions required by this Initial NTSP are completed and listed below.

- D/E-602-7040, Support Equipment Engine/Gas Turbine and Related Systems Intermediate Maintenance. Added MF information as required.
- D/E-602-7032, Support Equipment Electrician/Refrigeration Intermediate Maintenance. Added MF information as required.

- D/E-602-7035, Support Equipment Air Conditioning and Mobile Facility Technician. Added MF information as required.

I. ONBOARD (IN-SERVICE) TRAINING

1. Proficiency or Other Training Organic to the New Development

a. Maintenance Training Improvement Program. The Maintenance Training Improvement Program (MTIP) is used to establish an effective and efficient training system responsive to fleet training requirements. MTIP is a training management tool that, through diagnostic testing, identifies individual training deficiencies at the organizational and intermediate levels of maintenance. MTIP is the comprehensive testing of one's knowledge. It consists of a bank of test questions managed through automated data processing. The Deputy Chief of Staff for Training assisted in development of MTIP by providing those question banks (software) already developed by the Navy. MTIP was implemented per OPNAVINST 4790.2 series. MTIP allows increased effectiveness in the application of training resources through identification of skill and knowledge deficiencies at the activity, work center, or individual technician level. Refresher training is concentrated where needed to improve identified skill and knowledge shortfalls. (MTIP will be replaced by Aviation Maintenance In-Service Training (AMIST) in FY01).

b. Aviation Maintenance In-Service Training. AMIST is intended to support the Fleet training requirements now satisfied by MTIP, and in that sense is the planned replacement. However, it is structured very differently, and will function as an integral part of the new Aviation Maintenance Training Continuum System (AMTCS) that will replace the existing aviation maintenance training structure. AMIST will provide standardized instruction to bridge the training gaps between initial and career training. With implementation of AMIST, technicians will be provided the training required to maintain a level of proficiency necessary to effectively perform the required tasks to reflect career progression. AMIST will begin when funding becomes available. AMIST will replace MTIP in FY01.

c. Aviation Maintenance Training Continuum System. AMTCS will redesign the aviation training process (training continuum), and introduces Computer-Based Training (CBT) throughout the Navy technical training process. The application and adoption of recent advances in computer hardware and software technology have enabled CBT with its basic elements of Computer-Managed Instruction, Computer-Aided Instruction, and Interactive Courseware to be integrated into the training continuum and provide essential support for standardizing technical training. AMTCS for MFs will be on line in FY02.

2. Personnel Qualification Standards. NA.

3. Other Onboard or In-Service Training Packages. Marine Corps onboard training is based on the current series of MCO P4790.12, Individual Training Standards System Maintenance Training Management and Evaluation Program (MATMEP). This program is designed to meet Marine Corps, as well as OPNAVINST 4790.2G, maintenance training requirements. It is a

performance-based, standardized, level-progressive, documentable, training management and evaluation program. It identifies and prioritizes task inventories by MOS through a front-end analysis process that identifies task, skill, and knowledge requirements of each MOS. MTIP questions coupled to MATMEP tasks will help identify training deficiencies that can be addressed with refresher training. (MATMEP will be replaced by AMTCS in approximately FY02).

On-the-Job Training will be used to reinforce skill and knowledge required.

J. LOGISTICS SUPPORT

1. Manufacturer and Contract Numbers. Contracts are issued approximately every two years for re-procurement and to complete the initial outfitting.

CONTRACT NUMBER	MANUFACTURER	ADDRESS
N68335-98-C-0183	Gichner Shelter Systems	490 East Locust St. Dallastown, PA 17313
N68335-98-C-0058	Environmental Systems	4859 Victor St. P.O. Box 47856 Jacksonville, FL 32207

2. Program Documentation. MF program documentation includes the MF Program and Related Ancillary Equipment User's Logistics Support Summary (ULSS), the Operation and Maintenance Manual, and eight Maintenance Plans listed in paragraph M.

3. Technical Data Plan. The MF technical data plan consists mainly of NAVAIR 19-25-177, Description and Principles of Operation, dated 1 March 1995.

4. Test Sets, Tools, and Test Equipment. Common WC 990 test sets, tools, and test equipment will be used for installation and removal of MFs. The Dolly Set, M1022 is used to raise and lower the MF by means of hydraulic pumps. The Lifting Spreader and the MF Sling Assembly are used to on-load or off-load the MFs from transport vehicles.

5. Repair Parts. NA.

6. Human Systems Integration. NA.

K. SCHEDULES. MFs are delivered in accordance with Marine Corps table of Basic Allowance, Navy weapon systems planning data, and as replacement units. The schedules are set by Commander, Naval Air Systems Command.

L. GOVERNMENT-FURNISHED EQUIPMENT AND CONTRACTOR-FURNISHED EQUIPMENT TRAINING REQUIREMENTS. NA.

M. RELATED NTSPs AND OTHER APPLICABLE DOCUMENTS

DOCUMENT OR NTSP TITLE	DOCUMENT OR NTSP NUMBER	PDA CODE	STATUS
MF Program and Related Ancillary Equipment ULSS	NAWCADLKE-U70093005	COMNAVAIRSYSCOM	Draft April 98
Operation and Maintenance Manual	NAVAIR 19-25-177	COMNAVAIRSYSCOM	March 95
Maintenance Plan Type A Turnkey	MaPI-NAEC-CSE-0625:AA:RC	NAWCAD Lakehurst	Dec 96
Maintenance Plan Type B Turnkey	MaPI-NAEC-CSE-0626:AA:RC	NAWCAD Lakehurst	Dec 96
Maintenance Plan Integration Unit	MaPI-NAEC-CSE-0627:AA:RC	NAWCAD Lakehurst	Dec 96
Maintenance Plan Type A Side Opening	MaPI-NAEC-CSE-0628:AA:RE	NAWCAD Lakehurst	Dec 96
Maintenance Plan Type B Side Opening	MaPI-NAEC-CSE-0629:AA:RE	NAWCAD Lakehurst	Dec 96
Maintenance Plan Type B (Modified) Side Opening	NAWCADLKE-MAPL-93033:RB	NAWCAD Lakehurst	Dec 96
Maintenance Plan Type C Side Opening	NAWCADLKE-MAPL-93932:RB	NAWCAD Lakehurst	Dec 96
Maintenance Plan Electric Power Distribution System	NAWCADLKE-M70097036	NAWCAD Lakehurst	Dec 96
Maintenance Plan Environmental Control Unit (A/E32C-45)	MaPL-CSE-0526:AA:RB	NAWCAD Lakehurst	Dec 97
Maintenance Plan Environmental Control Unit (A/E32C-48)	NAEC-MAPL-34	NAWCAD Lakehurst	Dec 91

APPENDIX A - POINTS OF CONTACT

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